Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES
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Ex parte JENG-NAN SHIAU
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Appeal No. 96-0650
Application No. 08/117,591[1]
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HEARD: May 4, 1999
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Before HAIRSTON, JERRY SMITH and HECKER, Administrative Patent
Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1

through 40. In an Amendment After Final (paper number 15),

claims 1 and 17 were amended.[2]

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[1] Application for patent filed September 7, 1993.

[2] The amendment had the effect of overcoming the
indefiniteness rejection of claims 1 and 17 (paper number 16).

The disclosed invention relates to a color copier that

processes marker data during a single pass scan of a document.

The color copier also performs a thinning operation on the

marker data during the single pass scan.

Claim 36 is illustrative of the claimed invention, and it

reads as follows:

36. A copier for thinning buffered marker data during a
single pass scanning of a document, comprising:

first analyzing means for analyzing, during the single
pass scanning of the document, buffered marker data associated
with pixels adjacent to a first pixel, the first pixel being a
pixel in a first scanline, the first scanline having been
scanned prior in time to a scanline being presently scanned in
the single pass scanning of the document, to determine a
connectivity relationship of a marker line, the connectivity
relationship being between the first pixel and pixels adjacent
the first pixel; and

thinning means for eliminating, during the single pass
scanning of the document, buffered marker data associated with
the first pixel when said first analyzing means determines
that elimination of the buffered marker data associated with
the first pixel maintains connectivity of the marker line.

The references relied on by the examiner are:

Matsunawa et al. (Matsunawa)   5,216,498   June
1, 1993
Hardy et al. (Hardy)   5,261,012   Nov. 9,
1993
                                        (filed May 11, 1992)
Foley et al. (Foley), "Computer Graphics: Principles and
Practice," Addison-Wesley, 1991, pages 33 and 34.

Claims 1 through 3, 6 through 8, 17 through 19, 28, 31, 32 and 36 through 38 stand rejected under 35 U.S.C. § 103 as being unpatentable over Matsunawa in view of Hardy.

Claims 4, 5, 9 through 16, 20 through 27, 29, 30, 33 through 35, 39 and 40 stand rejected under 35 U.S.C. § 103 as being unpatentable over Matsunawa in view of Hardy and Foley.

Reference is made to the briefs and the answers for the respective positions of the appellant and the examiner.

<div align="center">OPINION</div>

The obviousness rejections are reversed.

Matsunawa discloses apparatus for detecting a marked region during a single scan of a document. The examiner acknowledges that Matsunawa is silent concerning thinning of the marked region (Answer, page 4). For such a teaching, the examiner turns to Hardy. According to the examiner (Answer, pages 4 and 5):

> Hardy et al discloses a system for thinning images. Hardy teaches that thinning is performed by examining the pixels adjacent to a given pixel, and carried out until an image formed of only lines or dots remains (column 2, lines 27-68). Hardy et al further teaches that the system may be used to make a zone of interest more easily recognizable (column 1, lines 23-38).

It would have been obvious to one of ordinary skill in the art to perform thinning, as taught by Hardy et al, on a detected marked region in the system of Matsunawa et al, in order to more accurately delineate a region enclosed by a marking line or a marking image, in order to facilitate subsequent processing of pixels in the delineated region, particularly in view of the teaching of Hardy et al that such processing may make a zone of interest more easily recognizable.

Appellant argues (Brief, page 6) that Hardy stores the "entire image prior to thinning because the data must be analyzed in a left to right direction, in a right to left direction, in an up to down direction, and in a down to up direction."

Hardy discloses that during the thinning process an image memory 28 (Figure 4) has image data stored therein, and that "the image memory will have 512 by 512 pixels (i.e., storage locations corresponding to pixels)," and that "[t]he image data will be scanned in four different directions" (column 7, lines 5 through 14). Figure 1 of Hardy illustrates the scanning of the data in the four directions. Such four-directional scanning can only be performed on data that has been previously stored in memory.

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In summary, we agree with appellant's argument (Reply
Brief, page 10) that Hardy "stores the entire image prior to
thinning."
The obviousness rejection of claims 1 through 3, 6 through 8,
17 through 19, 28, 31, 32 and 36 through 38 is reversed
because the applied references neither teach nor would they
have suggested to one of ordinary skill in the art the claimed
thinning <u>during</u> the single pass scanning of the document. The
obviousness rejection of claims 4, 5, 9 through 16, 20 through
27, 29, 30, 33 through 35, 39 and 40 is reversed because Foley
does not cure the noted shortcomings in Matsunawa and Hardy.

<u>DECISION</u>

The decision of the examiner rejecting claims 1 through 40 under 35 U.S.C. § 103 is reversed.

<u>REVERSED</u>

KENNETH W. HAIRSTON   )
Administrative Patent Judge   )
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) BOARD OF PATENT
JERRY SMITH   )   APPEALS
Administrative Patent Judge   )   AND
)   INTERFERENCES
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